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PRELIMINARY ASSESSMENT/ VISUAL SITE INSPECTION

LEHIGH PORTLAND CEMENT COMPANY
GARY, INDIANA
INT 190 011 973

FINAL REPORT

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, DC 20460

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EXECUTIVE SUMMARY

Resource Applications, Inc. (RAI) performed a preliminary assessment and visual site inspection (PA/VSI) to identify and assess the existence and likelihood of releases from solid waste management units (SWMU) and other areas of concern (AOC) at the Lehigh Portland Cement Company (Lehigh) facility in Gary, Indiana. This report summarizes the results of the PA/VSI and evaluates the potential for releases of hazardous wastes or hazardous constituents from SWMUs and AOCs identified.

The Lehigh facility in Gary, Indiana is a manufacturer of Lumnite and Refcon (trade names) refractory calcium aluminate cements and has been in operation since 1903. The 250-acre facility was originally built and operated by Illinois Steel (producing cement). After several ownership changes, Lehigh took over and has owned and operated the facility since 1970. The kiln had been fired with natural gas to produce the flame temperature of around 3,000°F required for the cement manufacture. During the early 1980s Lehigh had experimented with using a synfuel in its rotary kiln. The synfuel was a blend of recycled solvents (F001, F003) and ignitables (D001). The company's initial intent was to receive solvents from various sources and blend them to produce acceptable fuel. Lehigh filed a RCRA Part A permit application to protect that ability. The Part A permit application identified the facility as a treatment, storage, or disposal (TSD) facility. In 1984, the company realized that synfuel was better obtained from processors, blenders, and recyclers of solvents who are permitted under RCRA to produce the fuel. Because the facility stored and burned the synfuel they were regulated under RCRA as being a storage (tank) and thermal treatment facility. The company felt it was in its best interest to cease all RCRA activities in 1984, and closure was completed and approved by IDEM in 1986. Withdrawal of the RCRA Part A permit application was approved in 1987. Lehigh now uses natural gas alone to fire its kiln. Lehigh is no longer classified as a TSD; it is now classified as a non-handler of hazardous waste.

The PA/VSI identified the following eight SWMUs and one AOC at the facility:

Solid Waste Management Units

1. 7,800-Gallon Synfuel Tank
2. Rotary Kiln
3. Satellite Waste Accumulation Areas

4. Wastewater Treatment System
5. Dust Collectors
6. Waste Oil Tank
7. Waste Lubricant Storage Area
8. Battery Storage Area

Area of Concern

1. Cement Dust in the Manufacturing Area

The potential for release of hazardous constituents to air, ground water, and surface water is low for all SWMUs. There is a possibility that on-site soil could be contaminated. SWMUs 6, 7, and 8 all rest directly on soil and visual inspection of the areas revealed the possibility of waste oil, waste lubricant, and battery acid contamination. SWMU 1 is no longer active; SWMUs 2, 4, and 5 do not manage hazardous wastes; and any release from SWMU 3 would be small, indoors on concrete, and easily contained.

During the VSI (November 15, 1991), there was a large amount of Cement Dust in the Manufacturing Area (AOC 1). The dust could be a hazard to employees who must breathe the dust while working in the manufacturing area. There is no potential for release to ground water, surface water, or on-site soils from AOC 1 because all dust is contained inside the manufacturing area on a concrete floor.

Lehigh is located in an industrial area. The facility is partially surrounded by a chain-link fence; however, the gate is open during business hours. Residential areas exist about 1 mile west of the facility. The City of Gary receives its water from Lake Michigan, and there are no known ground water wells in the area. There are no wetlands or sensitive environments, except Lake Michigan, within 2 miles of the facility.

RAI recommends that the facility properly mark the areas of SWMU 3 and ensure that all drums are sealed. It is also recommended that the soil should be sampled around SWMUs 6, 7 and 8, since they are all storage areas on open soil. Finally, the facility should find a way to minimize the Cement Dust in the Manufacturing Area (AOC 1). RAI recommends no other further action.

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) received Work Assignment No. R05032 from the U.S. Environmental Protection Agency (EPA) under Contract No. 68-W9-0006 (TES 9) to conduct preliminary assessments (PA) and visual site inspections (VSI) of hazardous waste treatment and storage facilities in Region 5. Resource Applications, Inc. (RAI), TES 9 team member, provided the necessary assistance to complete the PA/VSI activities for the Lehigh Portland Cement Company (Lehigh).

As part of the EPA Region 5 Environmental Priorities Initiative, the RCRA and CERCLA programs are working together to identify and address RCRA facilities that have a high priority for corrective action using applicable RCRA and CERCLA authorities. The PA/VSI is the first step in the process of prioritizing facilities for corrective action. Through the PA/VSI process, enough information is obtained to characterize a facility's actual or potential releases to the environment from solid waste management units (SWMU) and areas of concern (AOC).

A SWMU is defined as any discernible unit where solid wastes have been placed at any time from which hazardous constituents might migrate, regardless of whether the unit was intended for the management of a solid or hazardous waste.

The SWMU definition includes the following:

- RCRA regulated units, such as container storage areas, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, and underground injection wells
- Closed and abandoned units
- Recycling units, wastewater treatment units, and other units that EPA has generally exempted from standards applicable to hazardous waste management units
- Areas contaminated by routine and systematic releases of wastes or hazardous constituents, such as wood preservative treatment dripping areas, loading or unloading area, or solvent washing areas.

An AOC is defined as any area where a release to the environment of hazardous waste or constituents has occurred or is suspected to have occurred on a non-routine or non-systematic basis. This includes any area where such a release in the future is judged to be a strong possibility.

The purpose of the PA is as follows:

- Identify SWMUs and AOCs at the facility.
- Obtain information on the operational history of the facility.
- Obtain information on releases from any units at the facility.
- Identify data gaps and other informational needs to be filled during the VSI.

The PA generally includes review of all relevant documents and files located at state offices and at the EPA Region 5 office in Indianapolis.

The purpose of the VSI is as follows:

- Identify SWMUs and AOCs not discovered during the PA.
- Identify releases not discovered during the PA.
- Provide a specific description of the environmental setting.
- Provide information on release pathways and the potential for releases to each medium.
- Confirm information obtained during the PA regarding operations, SWMUs, AOCs, and releases.

The VSI includes interviewing appropriate facility staff, inspecting the entire facility to identify all SWMUs and AOCs, photographing all SWMUs, identifying evidence of releases, initially identifying potential sampling locations, and obtaining all information necessary to complete the PA/VSI report.

This report documents the results of a PA/VSI of the Lehigh facility in Gary, Indiana. The PA was completed on November 13, 1991. RAI gathered and reviewed information from the Indiana Department of Environmental Management (IDEM) and from EPA Region 5 RCRA files. RAI also reviewed documents from the U.S. Department of Agriculture (USDA), the U.S. Geological Survey

(USGS), and the Federal Emergency Management Agency (FEMA). The VSI was conducted on November 15, 1991. It included interviews with Lehigh facility representatives and a walk-through inspection of the facility. Eight SWMUs and one AOC were identified at the facility.

The VSI is summarized and 17 inspection photographs are included in Attachment A. Field notes from the VSI are included in Attachment B.

2.0 FACILITY DESCRIPTION

This section describes the facility's location, past and present operations (including waste management practices), waste generating processes, release history, regulatory history, environmental setting, and receptors.

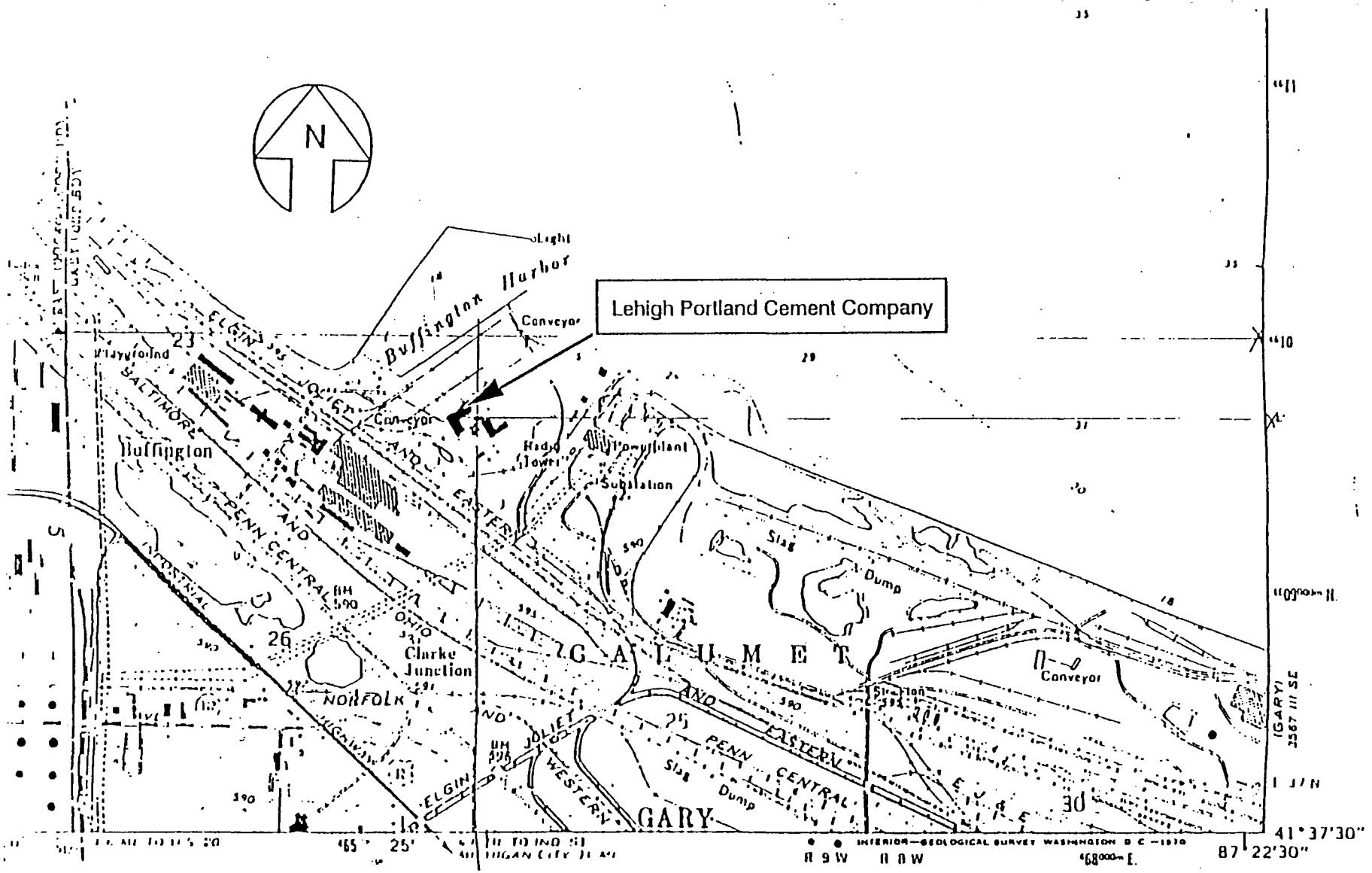
2.1 FACILITY LOCATION

The Lehigh Portland Cement facility is located at Buffington Station, Gary, Indiana at latitude 41° 38' 43" north and longitude 87° 24' 47" west (USGS, 1968) (Figure 1). Gary is a large industrial community in Lake County. Lehigh owns approximately 250 acres, with the various facility buildings spread throughout the property (Figure 2). The area to the south of the facility is vacant and Lake Michigan is directly to the north. Residential and light commercial areas exist to the west, and a lime plant and power plant operate to the east.

2.2 FACILITY OPERATIONS

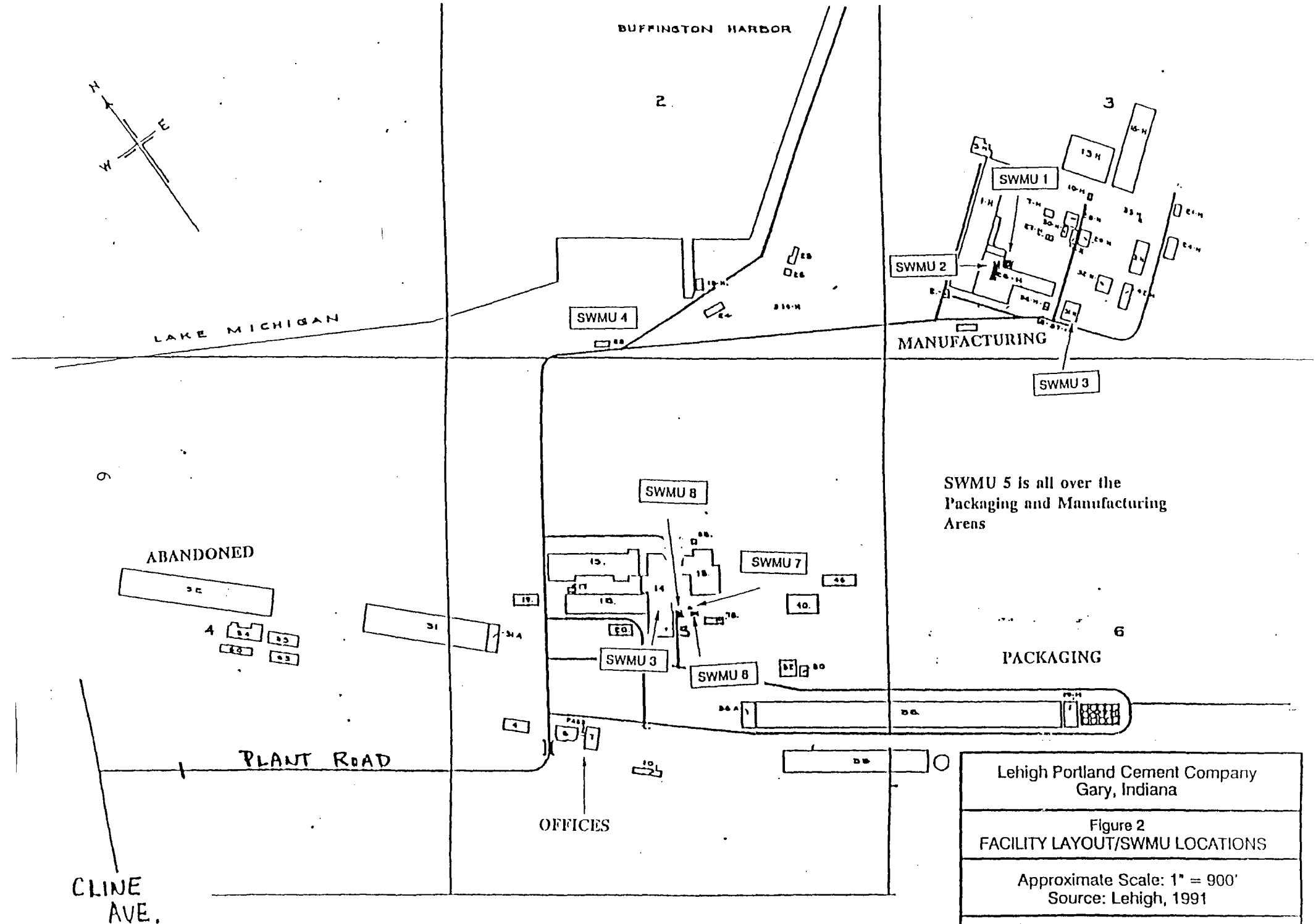
Lehigh is a cement manufacturer. Operations began at the site in 1903 when Illinois Steel produced portland cements. In 1970 the facility was sold to Universal Atlas Cement which eventually changed its name to Lehigh in 1980. At present, 79 people are employed by Lehigh (at the Gary site). The facility operates on a 10-day online/4-day offline system. While the plant is online, the employees work during three shifts, 24 hours a day (Pachapa, 1991).

Lehigh produces Lumnite and Refcon (trade names) refractory calcium aluminate cements. To produce these cements, limestone, bauxite, and other minor inorganic constituents are carefully blended and interground to a fine powder in a ball mill. The raw mix is then pelletized and introduced to a preheater kiln wherein the pellets are heated to approximately 600 to 700°F and then introduced into a rotary kiln where they are heated to approximately 2,600°F to produce the desired calcium aluminate compounds in the form of a clinker; that is, to form a solid mass. This clinker is cooled and then ground to a fine powder, along with various additives, in a ball mill to produce the finished cement.



QUADRANGLE LOCATION

Lehigh Portland Cement Company Gary, Indiana
Figure 1 FACILITY LOCATION
Scale: 1:1000 Source: USGS Topographical Map, 1968
Resource Applications, Inc.



Lehigh Portland Cement Company Gary, Indiana
Figure 2 FACILITY LAYOUT/SWMU LOCATIONS
Approximate Scale: 1" = 900' Source: Lehigh, 1991
Resource Applications, Inc.

Historically, the kiln has been fired with natural gas to produce a flame temperature (of the burner) of around 3,000°F which is a requirement for heating the material to 2,600°F. The material flow in the kiln is countercurrent to the gas flow, which is normal in cement kilns. Preheated combustion air is recovered from cooling of the clinker. Approximately 3.5 million BTUs of fuel input are required in the kiln to process each of the 300 to 400 tons per day of clinker produced by this operation. This translates to some 1,000 to 1,500 million BTUs per day or some 40 to 60 million BTUs per hour of heat input.

Because of the high cost and projected shortages of natural gas, a search was undertaken for substitute fuels which could partially or completely replace natural gas, both to reduce costs and conserve natural gas. Coal would not be a viable substitute because the composition of the ash would contaminate the product to an unacceptable degree. Fuel oil tended to suffer from the same projected problems as natural gas. Mixed waste solvents were projected as available long term, at reasonable prices, and would permit utilization of materials that would otherwise be wasted or be recoverable only with great difficulty.

Lehigh's initial intent was to receive waste solvent from various sources and blend them to produce acceptable fuel. The RCRA Part A permit application was filed to protect that ability under RCRA, although Lehigh never did blend their own mixture. As RCRA regulations and the solvent recovery industry developed, and given that their primary business is cement production and not waste processing or disposal, it became evident that waste solvent-derived "synfuels" were better obtained from processors, blenders, and recyclers of solvents who were permitted under RCRA, and who were better able to produce acceptable fuel for their use (Lehigh, 1984b).

When available, and depending upon the product being produced, Lehigh tried to use synfuel as 50 percent of the kiln fuel, substituted for natural gas on a 1-for-1 BTU basis. Because of their equipment, availability of suitable synfuel, periodic production delays, and their refusal to use synfuel on startup and shutdown, average monthly usage ranged from 0 to 33 percent of the total kiln fuel, replacing natural gas.

The synfuel burned in the cement kiln was a partial substitute for the natural gas and was purchased as a specification fuel. The supplier of this fuel was Fisher-Calo Chemicals & Solvents

Corporation (USEPA ID #IND064700883). The synfuel was physically blended to specification from the "still-bottoms" of a solvent recovery operation. The minimum heating value of the "synfuel" was 10,000 BTU per pound; usually averaging 14,000 to 15,000 BTUs per pound (Lehigh, 1984a).

In April, 1984, EPA acknowledged that the use of synfuel constituted legitimate recycling activity. At the same time, EPA indicated that in 1983 the facility had accepted, and presumably stored and burned 60,000 gallons of solvent waste described in the manifests as D001 and F003; and 43,800 gallons of wastes identified as D005, F003, and F001. Based on this review, EPA had determined that Lehigh had stored the listed wastes and concluded that an incinerator (the kiln) was operated at the facility. To avoid RCRA regulations, the facility decided to abandon all synfuel activity. Closure activities were conducted in accordance with an approved closure plan. On April 13, 1987, Lehigh Portland Cement Company received acknowledgement that their RCRA Part A permit application withdrawal request had been accepted and that the company was classified as a non-handler of hazardous waste (IDEM, 1987). The following hazardous waste activities were eliminated as part of the closure: thermal treatment in an incinerator and storage in a tank.

The present day operation of the Lehigh Portland Cement Company is the same as initially described. The company now uses only natural gas to obtain the desired temperatures in the rotary kiln.

Table 1 lists Lehigh's Solid Waste Management Units (SWMUs) and Figure 2 shows their locations.

2.3 WASTE GENERATING PROCESSES

Lehigh never generates, or generated, waste from its cement manufacturing process. In the early 1980s Lehigh had synfuel (fuel from recycled solvents) shipped in for use in their rotary kiln. The synfuel was kept in a 7,800-Gallon Synfuel Tank (SWMU 1) and pumped into the Rotary Kiln (SWMU 2). When the kiln was fired by synfuel it was considered an incinerator of waste materials under RCRA which made it a SWMU. The use of synfuel was terminated in 1984.

TABLE 1

SOLID WASTE MANAGEMENT UNITS

SWMU Number	SWMU Name	RCRA Hazardous Waste Management Unit[a]	Status
1	7,800-Gallon Synfuel Tank	Yes	Removed, closure certified 09/19/86
2	Rotary Kiln	Yes	Closed, closure certified 09/19/86 (as an incinerator unit, but the kiln itself is still operational)
3	Satellite Waste Accumulation Areas	No	Active
4	Wastewater Treatment System	No	Active
5	Dust Collectors	No	Active
6	Waste Oil Tank	No	Active
7	Waste Lubricant Storage Area	No	Active
8	Battery Storage Area	No	Active

Note:

[a] A RCRA hazardous waste management unit is one that currently requires or formerly required submittal of a RCRA Part A or Part B permit application.

The facility has a machine shop which is used for lubrication and maintenance of facility vehicles. The shop utilizes many Satellite Waste Accumulation Areas (SWMU 3) for nonhazardous waste oils, rags, scrap metal and a small amount of spent solvents which are diluted and manifested as nonhazardous. The waste oils are collected in 55-gallon drums in the shop and removed and pumped into the Waste Oil Tank (SWMU 6). The oil is then hauled off site by Safety-Kleen of Elgin, Illinois for disposal. Before removal, Safety-Kleen samples the waste to verify that the waste is nonhazardous. Waste oil amounts vary with time. In 1990, 250 gallons were removed; in 1989, 800 gallons were removed; and in 1987, 1,100 gallons were removed (Pachapa, 1991). All scrap metal is hauled off site to Industrial Scrap of East Chicago, Indiana. The oil rags are disposed of as nonhazardous solid waste (paper, wood, etc.) and removed by Illiana Disposal Service.

The Waste Lubricant Storage Area (SWMU 7) and Battery Storage Area (SWMU 8) are adjacent to the maintenance shop. These areas contain used lubricants (grease, waste gear shield, and other lubricants) and used batteries from company vehicles. The wastes are not generated at a regular pace. When the waste oil is removed (about once a year) the waste lubricants are added to the Waste Oil Tank (SWMU 6) and taken off site by Safety-Kleen. The batteries are removed for off-site disposal about once a year.

Lehigh has its own Wastewater Treatment System (SWMU 4). Sanitary sewage from all the buildings on the property is pumped to the system. It goes through a trickle bed with spray irrigation which is used to perform a bioreaction which reduces the biological oxygen demand. The water is then chlorinated and dechlorinated and then pumped into Lake Michigan. No sludges are generated by SWMU 4. Weekly sampling of the water is performed to maintain the integrity of the system.

All of the manufactured cement is in a dry powder form. During manufacture and packaging procedures cement dust is controlled through the use of Dust Collectors (SWMU 5). The high speed production process, and the sheer volume of product, lead to large quantities dust which are collected primarily in bag filters. The bag filters are removed, emptied, and reused in the process. The facility also has a mechanical dust collector (electrostatic precipitator) that collects dust in a hopper. This collector is also emptied of dust, which is returned to the process.

The facility has a parts washer which is used to clean small hand tools. The solvent (p-menthadiene and cyclohexane) is recycled in the washer over a long period of time and is removed in small quantities and blended into the Waste Oil Tank (SWMU 6). Safety-Kleen tests the contents of the tank before removing the waste and has always determined that the waste is nonhazardous. The facility could not give a definite rate of generation for the spent solvent.

Table 2 lists the solid wastes, and the units that managed the wastes, for the Lehigh facility.

2.4 RELEASE HISTORY

The 7,800-Gallon Synfuel Tank (SWMU 1) was installed in 1982 in the area immediately adjacent to the northeast wall of the manufacturing plant. Prior to installation of the tank, this area had been exposed for many years to minor amounts of kiln, clinker, and cement dust from the plant. This dust exposure, combined with normal precipitation, has cemented the ground in this area, making it hard and impermeable. The tank was surrounded by a low concrete dike to provide spill containment and runoff protection. Consequently, any spilled material was confined to the containment area around the tank. When the tank was removed (during closure), standing oil was observed on the concrete base within the containment area.

From observations (including IDEM staff observations), the maximum contamination from fuel materials covered no more than 10 percent of the containment area (Lehigh, 1986). A conservative estimate, with consideration of ground conditions, was that spilled material could have penetrated into the soil no more than 0.5 inch. (This was later visually verified during the course of the excavation and removal.) To be safe, an area 20 feet by 20 feet, centered on the observed oil, was excavated to a depth of 3 to 3.5 feet and the soil removed, mixed with 20,000 tons of limestone, and used as raw material for cement manufacture.

Prior to back filling the excavation with clean limestone, no evidence of stained ground could be seen nor were any odors of oil or solvents detected (Lehigh, 1986). No further action was required of the facility regarding the spilled material (IDEM was present) (Lehigh, 1986).

TABLE 2

SOLID WASTES

Waste/EPA Waste Code	Source	Primary Management Unit
Synfuel/D001, D005, F001, F003	Off site shipment to Lehigh (for use in rotary kiln)	1, 2
Wastewater/Nonhazardous	Facility Sewage	4
Used Filter Bags/Nonhazardous	Dust Collectors	5
Waste Oil/Nonhazardous	Vehicle Maintenance	3, 6
Waste Lubricants/Nonhazardous	Machinery Maintenance	7, 6
Spent Solvents	Parts Washer	6
Used batteries/Nonhazardous	From Replacing Company Vehicle Batteries	8
Waste Oil Rags/Nonhazardous	Maintenance Shop	3
Metal Shavings/Nonhazardous	Machine Shop	3

The Rotary Kiln (SWMU 2) or faulty Dust Collectors (SWMU 5) may be releasing cement dust into the air within the facility. During the VSI, on November 15, 1991, a large amount of cement dust was observed on the floor of the manufacturing area. The kiln was being taken off-line, and it could not be determined if the dust was a result of faulty dust collectors or if it was from spillage of product off the conveyor belt. The dust was on the floor and not floating around the area; however, employees walking on the dust would kick it up and force it into the air.

2.5 REGULATORY HISTORY

Lehigh submitted a Notification of Hazardous Waste Activity Form to EPA on January 19, 1981 (Lehigh, 1981a). On January 20, 1981, Lehigh filed a RCRA Part A permit application stating that 36,500 tons of F003 and F005 waste were being incinerated in its cement kiln (Lehigh, 1981b). The Part A permit application identified the facility as a treatment, storage, or disposal (TSD) facility. The purpose of the filing was for the use and handling of reclaimed solvents and oils as a supplementary fuel. In 1984, Lehigh requested withdrawal of the Part A permit application stating that the waste materials were being used as fuels, and thus, Lehigh fell under the recycle and reuse exemptions of RCRA (Lehigh, 1984b). The request was reviewed by EPA and it was determined that the burning of synfuel constituted legitimate recycling activity. Therefore, the kiln qualified for exclusion under 40 CFR 261.6(a). However, Lehigh was still required to retain the Part A permit application because it stored listed wastes and sludges identified in Subpart D, 40 CFR 261. Also, Lehigh should have listed D001, D005, F001, and F003 wastes on the Part A permit application (EPA, 1984). There is no record in file materials reviewed that Lehigh ever submitted a revised Part A permit application.

On June 19, 1984, an inspection of Lehigh was conducted by the Division of Land Pollution Control of the Indiana State Board of Health. A letter followed the inspection stating that Lehigh was in violation for disregarding compliance with RCRA and Indiana Department of Environmental Management (IDEM) requirements (IDEM, 1984). Violations with respect to hazardous waste handled in SWMU 1 included the following: no contingency plan, no danger signs, inadequate security, lack of personnel training records, no inspection schedule, and no inspection log. At this same time, Lehigh was given notice that no further storage or receipt of hazardous waste was to be

conducted until compliance had been achieved and documented by representatives of the Division of Land Pollution Control of the Indiana State Board of Health (IDEM, 1984).

On September 17, 1984, in response to the inspection and to avoid further RCRA regulations, Lehigh submitted a closure plan to IDEM. The plan was reviewed by the Division of Land Pollution Control, Indiana State Board of Health. After several modifications to the plan, the final submittal, dated May 17, 1985, was accepted by IDEM (IDEM, 1985).

On December 18, 1985, the Division of Land Pollution Control of the Indiana State Board of Health conducted a closure inspection. Part of the closure plan included removal of approximately 44.5 tons of soil that had been under the 7,800-Gallon Synfuel Tank (SWMU 1), to be used as feed material for the kiln. The excavation area was then filled with clean limestone. The Division of Land Pollution Control of the Indiana State Board of Health had some concern about soil contamination in this area and the fact that no soil samples were taken directly under the hazardous waste storage tank (synfuel), although signs of spillage were noticed. They also questioned the rationale for the amount of soil removed from under the storage tank, i.e., with no soil samples and analysis data available for guidance. Hence, on July 3, 1986, Lehigh was requested by IDEM to submit sampling and analytical data that conclusively demonstrated that all contaminated soil had been removed in the area underneath the hazardous waste storage tank (IDEM, 1986a).

On August 11, 1986, Lehigh submitted a letter to IDEM explaining the rationale behind the amount of soil excavation (Lehigh, 1986). No sampling was performed as part of final closure. No further information was available.

On September 19, 1986 IDEM submitted a letter to Lehigh confirming receipt of closure certifications dated November 18 and November 26, 1985, that total closure of the storage tank and rotary kiln had been completed as outlined in the closure plan. With the receipt of the certifications, closure was complete as required by 320-IAC-4.1-21 (IDEM, 1986b).

On April 13, 1987, IDEM submitted a letter to Lehigh Portland Cement Company stating that IDEM determined that the facility is no longer a TSD facility and that the Part A permit application was withdrawn. The company became classified as a non-handler of hazardous waste (IDEM, 1987).

A National Pollutant Discharge Elimination System (NPDES) permit was issued to the facility for the release of treated sanitary sewage from the facility to Lake Michigan. The permit (NPDES Permit No. IN0029793) was issued in 1988 and is valid through August 1993. Lehigh must sample and monitor discharge weekly, and submit results to IDEM every month. Lehigh has multiple air permits to operate its dust collectors and its rotary kiln. The permits are issued by the City of Gary, Air Pollution Control Division of Department of Health. All permits are valid until February 1992. There is no record of violations of NPDES or air regulations.

2.6 ENVIRONMENTAL SETTING

This section describes the climate; flood plain and surface water; geology and soils; and ground water in the vicinity of the facility.

2.6.1 Climate

Lake County has a temperate, humid, continental climate. The average daily temperature in Hobart, Indiana, the National Weather Service station, is 50.6°F but the range in temperature from summer to winter is wide. Prevailing winds from Lake Michigan have a modifying effect on temperature extremes. The average daily maximum temperature is 86.2°F in July and the average daily minimum temperature is 17.4°F in January (USDC, 1963).

The mean annual precipitation is 36.01 inches and net annual precipitation is 6 inches (USDC, 1963). The maximum 1-day, 24-hour rainfall was 5.64 inches in 1941 (USDC, 1963). Precipitation is fairly well distributed throughout the year but is slightly greater in spring than in the other months. Soils are frozen approximately 3 to 4 months per year. The average seasonal snowfall is 27.6 inches.

Relative humidity varies greatly and may change by as much as 50 percent (from 40 to 90 percent) during the course of one day. Prevailing winds are from the south southwest at 10.6 miles per hour. The average wind speed is highest in March at 12.4 miles per hour from the north northwest.

2.6.2 Flood Plain and Surface Water

The Grand Calumet River is the primary drainage channel for the Lake Michigan regional watershed. Most of the land was originally marshy and has been artificially drained and filled.

The general direction of surface flow is northward toward Lake Michigan, which is immediately north of the facility. The Grand Calumet River is less than 2 miles south and the Indiana Harbor Canal is approximately 3 miles west of the facility. The terrain has been altered by development, and drainage of surface water has been affected by construction. The site locale is classified as a Zone C flood plain, that is, an area of minimal flooding outside the 500-year flood plain (FEMA, 1981).

2.6.3 Geology and Soils

Since no site information was available, regional information is presented. The area is on a broad, gently sloping arch, called the Kankakee Arch, which is Paleozoic in age. This arch separates two broad depressions, the Illinois Basin to the southwest and the Michigan Basin to the northeast. The oldest and deepest rocks in the area are Precambrian granites. Cambrian System rocks are largely sandstones in the lower half and dolomites, sandstones, and siltstones in the upper half. These rocks are overlain by lower Ordovician dolomites of the Canadian Series and middle Ordovician sandstones, limestones, and dolomites of the Champlainian Series. Younger rocks of upper Ordovician, Silurian, and lower Devonian form the Tippecanoe Sequence. The principal bedrock unit under the site consists of Niagaran dolomites, cherty limestones, and shales of Silurian age. Middle and upper Devonian limestones are overlain by black shales which are found in discontinuous pockets (Willman, 1971).

The Pleistocene Series consists of all the unconsolidated rocks which overlie the Paleozoic bedrock. These are predominantly glacial in origin, but also include alluvial and lacustrine deposits. The materials deposited include tills of sand and gravel from streams and rivers flowing out of the glaciers and lacustrine sands, silts, and clays deposited in lakes dammed by the ice. After the ice retreated from the area, winds blew sand into dunes and deposited a thin mantle of silt on the

uplands. Peat accumulated in low-lying areas, and streams deposited alluvium on their flood plains. Artificial fill, created by development, forms the surface deposit under the site.

The soil in the area is classified as urban land according to the U.S. Department of Agriculture Soil Conservation Service (USDA, 1972). These are areas that have been filled with earth, cinders, slag, trash, and/or other fill materials. The surface layer and subsoil have been removed or have been disturbed to such an extent that the original soil can no longer be identified.

In adjacent areas where undisturbed soil remains intact, the soils are classified as Oakville-Tawas Complex. This complex is about 45 percent Oakville fine sand and 45 percent Tawas muck. The rest consists of Maumee loamy fine sand. The soils have strongly contrasting properties. The excessively drained Oakville fine sand is on elongate ridges and the very poorly drained Tawas muck is in sloughs. The ridges and sloughs occur as alternating strips approximately 60 to 100 feet wide, extend in the same general direction as the lake shore, and represent former strand lines.

The Oakville soils are low in organic matter content, have very low available moisture content, and are rapidly permeable. The Tawas acreage is characterized as a grassy swamp with a major limitation to use being wetness. The areas can be used for urban development only where adequate drainage can be established. Drainage close to Lake Michigan is restricted by a high water table (Wilman, 1971).

2.6.4 Ground Water

The primary water source for domestic use is Lake Michigan. Ground water is not used as a source of drinking water in the area and there are no known wells within 3 miles of the facility.

Lake County is underlain by a sequence of approximately 4,500 feet of sedimentary rocks ranging in age from Cambrian to Quaternary. Some ground water is produced from rocks of each age. In the vicinity of the facility, the depth to the top of bedrock is approximately 140 feet and the principal sources of ground water occur within the upper 350 to 400 feet of rocks. In Lake County, the hydrologic system consists of four aquifers. However, the principal aquifer, a Pleistocene sand, is not present beneath the site.

The Cambrian/Ordovician System consists of sandstones and dolomites and forms a deep aquifer which is used for industrial wells. The Silurian aquifer consists chiefly of dolomites and forms the principal bedrock aquifer. Permeability decreases quickly with depth and only the top 100 feet are considered sufficiently permeable to be part of the aquifer. Ground water flow is from south to north from a ground water divide running east/west across the county approximately 18 miles south of the facility.

The bedrock is overlain by unconsolidated rocks of Quaternary age which are locally more than 250 feet thick. These rocks are chiefly the result of glaciation and have been divided into four lithologic units. The lowest unit is clay till and forms the principal confining layer to the Silurian System. Production from this unit is limited to discontinuous zones of intertill sand and gravel. The next lower unit is a sand and forms the principal Pleistocene aquifer in the county. However, this unit does not occur underneath the facility. The second highest unit consists of clay till and production from this unit is limited to thin, discontinuous intertill sand and gravel zones.

The uppermost unit consists chiefly of sand and produces about 25 percent of ground water pumped in the county. Most of the ground water pumped is used for industrial and commercial purposes, although East Gary and North Chicago pump about one million gallons per day for municipal use. The principal ground water divide for the unit is approximately four miles south of the site. The piezometric gradient is approximately 25 feet over this distance and ground water flow under the site is northward toward Lake Michigan. The hydrology of this unit has been altered by development and the unit is very susceptible to contamination by industrial waste (Rosenshein and Hunn, 1968).

2.7 RECEPTORS

The facility is located in an industrial area of Gary, Indiana which has a population of 152,000. Residential areas are located approximately 1 mile west of the facility. The facility entrance is fenced and has controlled entry. The possibility of direct public contact with hazardous wastes is minimal. There are no city storm sewers. The facility obtains its water from the City of Gary supply system which gets its water from Lake Michigan. There are no public water supply

wells within 3 miles of the facility. Public contact with contaminated ground water from the facility is unlikely.

There are no wetlands or other sensitive environments, except Lake Michigan, within 2 miles of the facility. There are no habitats of endangered species within 2 miles.

There has been one release of oily waste from the 7,800-Gallon Synfuel Tank (SWMU 1), but the area has been excavated and the waste has been disposed of. The Cement Dust in the Manufacturing Area (AOC 1) could possibly be a hazard to facility employees, but no injuries or contamination have been documented.

3.0 SOLID WASTE MANAGEMENT UNITS

This section describes the eight SWMUs identified during the PA/VSI. The following information is presented for each SWMU: description of the unit, dates of operation, wastes managed, release controls, history of release, and RAI observations.

SWMU 1 **7,800-Gallon Synfuel Tank**

Unit Description: This unit is a 7,800-gallon steel tank that was used to store synfuel (primarily recycled solvents). The tank was adjacent to the main plant and was above ground. After synfuel use was discontinued the tank was cleaned by jet spraying it with solvent and was then removed. Access to the unit was unrestricted (see Figure 2 and Photographs No. 6 and 7). The unit has been formally RCRA closed and is no longer used.

Date of Startup: This unit began operation in 1982.

Date of Closure: Inactive since 1984. Removed during closure activities. Closure completed September 19, 1986.

Wastes Managed: This unit managed 36,500 tons per year of synfuels which primarily consisted of spent solvents (F001, F003) and ignitables (D001).

Release Controls: The tank was above ground and had a low concrete dike to provide spill containment and runoff protection.

History of Documented Releases: During closure, the soil under and around the tank was found to be contaminated with an oily residue. An area 20 feet by 20 feet was excavated to a depth of 3 to 3.5 feet and the soil removed. This represented some 44.5 cubic yards of material, or 44.5 tons. The

44.5 tons of material were blended with a 20,000 ton stockpile of limestone raw material and used for cement manufacture.

Observations: At the time of the VSI (November 15, 1991), the tank had been removed and the former tank area appeared sound. There was no visual evidence of contamination of the fill area. No wastes remained in the area.

SWMU 2 **Rotary Kiln**

Unit Description: This unit is a 150-foot long rotating kiln used for manufacturing cement. The unit was considered an incinerator of hazardous waste when Lehigh used synfuel to heat the kiln. The unit has been formally RCRA closed and is no longer used as an incinerator. The unit continues to be used in the cement manufacturing process. Access to the unit was unrestricted (see Figure 2 and Photographs No. 8 and 9).

Date of Startup: 1970

Date of Closure: Inactive since 1984. Closure (as an incinerator of hazardous waste) completed September 19, 1986. The unit is still used in the manufacture of cement, but no longer burns hazardous waste.

Wastes Managed: This unit managed 36,500 tons per year of synfuels which primarily consisted of spent solvents (F001, F003) and ignitables (D001).

Release Controls: The unit was inside the main plant, over a concrete floor. If a hazardous spill were to occur it would have been contained within the plant. Dust collectors are used to control cement dust as a result of manufacturing.

History of Documented Releases: No releases have been documented from this unit.

Observations: At the time of the VSI (November 15, 1991), the kiln was being shut down (cooled) because it was going off-line. The kiln appeared structurally sound; however, there was a lot of cement dust on the floor around the kiln. It could not be determined if it was directly from the kiln, or if it was from spillage off the conveyor belt (adjacent to the kiln). The unit no longer manages hazardous wastes.

SWMU 3 **Satellite Waste Accumulation Areas**

Unit Description: This unit consists of a temporary indoor drum storage areas in the maintenance shop. Access to them is unrestricted. The number of units varies over time and there are no marked areas. These areas contain scrap metal, waste oil, oil rags, and spent solvents. Only one or two drums were stored in each area, before being removed outside to the Waste Oil Tank (SWMU 6) or for removal off site (see Figure 2 and Photographs No. 14, 15, and 16).

Date of Startup: 1970

Date of Closure: These units are currently active.

Wastes Managed: These units manage nonhazardous waste oil, scrap metal, oil rags, and small amounts of spent solvents (p-menthadiene and cyclohexnane).

Release Controls: The units are indoors, on concrete, but do not have any secondary containment.

History of Documented Releases: No releases have been documented from these units.

Observations:	At the time of the inspection, the facility had two 55-gallon drums of waste oil in the shop that were uncovered and unmarked (there was a no smoking sign). The oil rags were kept in smaller containers, and scrap metal was being kept in machine drip pans (under lathes). There were no spent solvents on site. The concrete floors appeared sound, without cracks, and there was no visual evidence that a release had ever occurred in a satellite area.
SWMU 4	**Wastewater Treatment System**
Unit Description:	The unit is on the north side of the property, directly adjacent to Lake Michigan. Access to the unit is unrestricted. Sanitary sewage from all the buildings on the property is pumped to the system through pipelines. It goes through a trickle bed with spray irrigation, which is used to perform a bioreaction which reduces the biological oxygen demand. The water is then chlorinated and dechlorinated and then pumped into Lake Michigan. Weekly sampling of the water is performed to maintain the integrity of the system (see Figure 2, no Photograph available).
Date of Startup:	1988
Date of Closure:	The unit is currently active.
Wastes Managed:	This unit manages sanitary sewage from the facility and does not process wastewaters.
Release Controls:	The unit is monitored and water is sampled weekly, but there is no form of secondary containment.

History of Documented Releases:	No releases have been documented from this unit, and there is no documentation of any permit violations.
Observations:	The system appeared sound and there was no visual evidence that a release had ever occurred in the unit. The outfall into Lake Michigan showed no visual signs of contamination.
SWMU 5	**Dust Collectors**
Unit Description:	Dust collectors are located throughout the facility's production area and packaging areas. They are used to control the cement dust that gets into the air during the routine operations of the facility. Lehigh has operating permits for all of the dust collectors. Access to the units is unrestricted. Most of the units use bag filters and are above operations and difficult to reach; however, the facility also uses a mechanical dust collector (electrostatic precipitator) on its rotary kiln (see Figure 2 and Photograph No. 10).
Date of Startup:	1970
Date of Closure:	The dust collectors are currently active.
Wastes Managed:	The dust collectors manage nonhazardous cement dust from facility operations (production and bagging).
Release Controls:	The dust collectors are primarily outside and use bag filters which are emptied back into process and recycled. The mechanical dust collector collects dust in a hopper which is also emptied back into process. There is no form of secondary containment.
History of Documented Releases:	No releases have been documented from these units.

Observations:	At the time of the inspection the facility was taking the rotary kiln off-line, There was a lot of cement dust on the manufacturing area floor around the kiln. It could not be determined if it was a result of a faulty dust collector, or if it was from spillage off the conveyor belt (adjacent to the kiln). The dust collectors do not handle hazardous wastes.
SWMU 6	**Waste Oil Tank**
Unit Description:	This unit is a 2,000-gallon steel tank that is used to store waste oils from vehicle and machine maintenance. The tank rests directly on the ground southeast of the maintenance shop. The unit has a 4-foot earthen dike around the tank to prevent a spill from spreading. Approximately once a year, Safety-Kleen of Elgin, Illinois samples the tank before emptying the tank for off-site treatment (See Figure 2 and Photograph No. 11).
Date of Startup:	1970
Date of Closure:	This unit is currently active.
Wastes Managed:	This unit manages varying amounts of waste oil, waste lubricants, and small amounts of spent solvents (p-menthadiene and cyclohexane). The last three times the tank was emptied by Safety-Kleen were 1990, 1989, and 1987. Volumes removed were 250 gallons, 800 gallons, and 1,100 gallons, respectively.
Release Controls:	The unit is outside, on open soil. The tank is surrounded by a 4-foot earthen dike.
History of Documented Releases:	No releases have been documented from this unit.

Observations:	The tank appeared to have oil spilled over the top. It appeared weather-beaten, but did not appear to be leaking. It was impossible to see under the tank because it rested on open soil. The soil around the tank looked relatively clean. The waste oil is kept for longer than 90 days.
SWMU 7	**Waste Lubricant Storage Area**
Unit Description:	This area is directly adjacent to the Waste Oil Tank (SWMU 6). Spent lubricants are kept in well-maintained, properly labeled 55-gallon drums. After facility vehicles and machinery are lubricated, the waste is put into the drums and stored next to the Waste Oil Tank. These wastes are eventually mixed into the Waste Oil Tank (SWMU 6), and also removed by Safety-Kleen. Access to the area is unrestricted (see Figure 2 and Photograph No. 12).
Date of Startup:	1970
Date of Closure:	This unit is currently active.
Wastes Managed:	These drums manage grease, waste gear shield, and waste lubricants.
Release Controls:	The unit is outdoors, with the drums resting on open soil. The area does not have any secondary containment.
History of Documented Releases:	No releases have been documented from this unit.
Observations:	At the time of the VSI (November 15, 1991), six drums of waste were observed in the area. The drums appeared structurally sound and were labeled (dated 7/10/91), but several of the drums were not properly

closed or sealed. There was no visual evidence that a release had ever occurred in the area.

SWMU 8	**Battery Storage Area**
Unit Description:	The area is southeast of the maintenance shop. It is used to store used batteries from facility vehicles. The batteries are stored on top of each other on a wood pallet and open soil. Access to the area was unrestricted (see Figure 2 and Photograph No. 13).
Date of Startup:	1970
Date of Closure:	The unit is currently active.
Wastes Managed:	This unit is managing 20 used batteries from facility vehicles.
Release Controls:	The batteries are stored outside, on open soil, and there is no form of secondary containment.
History of Documented Releases:	No releases have been documented from this unit.
Observations:	The area is storing batteries on open soil. There is no way to tell how long the batteries have been there. The batteries are exposed to the weather and many of them appeared to be leaking battery acid onto the soil.

4.0 AREAS OF CONCERN

RAI identified one AOC during the PA/VSI. This is discussed below.

AOC 1 **Cement Dust in the Manufacturing Area**

At the time of the VSI (November 15, 1991), the facility was taking the rotary kiln off-line. It had just finished a 10-day production cycle. There was a large amount of cement dust on the floor of the production area. The cement dust did get as deep as 0.5 inch in some areas. The facility cleans up the area and puts the dust back into process so it is not a waste. However, it is unclear where all the dust comes from and the dust is considered an AOC because it could be a hazard to facility employees who must breathe the dust while working in the manufacturing area.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The PA/VSI identified eight SWMUs and one AOC at the Lehigh facility. Background information on the facility's location, operations, waste generating processes, release history, regulatory history, environmental setting, and receptors is presented in Section 2.0. SWMU-specific information, such as the unit's description, dates of operation, wastes managed, release controls, release history, and observed condition, is discussed in Section 3.0. The AOC is discussed in Section 4.0. Following are RAI's conclusions and recommendations for each SWMU and AOC. Table 3 identifies the SWMUs and AOC at the Lehigh facility and suggested further actions.

SWMU 1 **7,800-Gallon Synfuel Tank**

Conclusions: This unit is no longer active. During closure, the soil under the tank was visibly contaminated. A total of 44.5 cubic yards of soil was removed and blended with a 20,000-ton stockpile of limestone raw material and used for cement manufacture. From observations (including IDEM staff observations), the maximum contamination from fuel materials covered no more than 10 percent of the containment area. A conservative estimate, based on soil conditions, was that the spilled material could not have penetrated more than 0.5 inch. To be safe, the excavation was taken to a depth of 3 to 3.5 feet. The potential for release via various pathways is summarized below:

Ground water: Low. The tank was above ground and the area has been closed. Contaminated soil was removed and there is no further sign of contamination.

Surface water: Low. The unit was not near surface water, has been closed and visual contamination was remediated.

On-Site Soil: Low. The unit has been closed, and all visibly contaminated soil was excavated and removed during closure. There was no contamination at depths greater than 0.5 inch.

TABLE 3

SWMU AND AOC SUMMARY

SWMU	Dates of Operation	Evidence of Release	Recommended Further Action
1. 7,800-Gallon Synfuel Tank	1982 to 1984	Contaminated soil was removed	No further action at this time.
2. Rotary Kiln	1970 to present (RCRA regulated as an incinerator from 1982 to 1986)	None	Determine if cement dust on the manufacturing floor is a result of the kiln, and if it is, take appropriate measures.
3. Satellite Waste Accumulation Areas	1970 to present	None	The facility should find a better way to properly mark the areas and seal all drums.
4. Wastewater Treatment System	1988 to present	None	No further action at this time.
5. Dust Collectors	1970 to present	None	Determine if cement dust on the manufacturing floor is a result of faulty dust collectors and if it is, take appropriate measures.
6. Waste Oil Tank	1970 to present	Oil spillage on tank	Sample soil around the tank.
7. Waste Lubricant Storage Area	1970 to present	Unsealed drums	Sample soil in the area.
8. Battery Storage Area	1970 to present	Leaking battery	Sample soil in the area.

TABLE 3 (cont.)

SWMU AND AOC SUMMARY

AOC	Dates of Operation	Evidence of Release	Recommended Further Action
1. Cement Dust in the Manufacturing Area	1970 to present	Visual inspection of manufacturing area	The facility should find a way to minimize cement dust in the manufacturing area.

Air: Low. The unit has been closed and there is no sign of current contamination.

Recommendations: No further action is recommended at this time.

SWMU 2 **Rotary Kiln**

Conclusions: This unit is currently active; however, it is not subject to RCRA regulations because it no longer burns synfuels. The kiln underwent closure and has not been used as an incinerator of hazardous wastes since 1984. The potential for release via various pathways is summarized below:

Ground water: Low. The unit is indoors, over concrete, no longer uses synfuel, and there is no visual sign of contamination.

Surface water: Low. The unit is indoors, over concrete, no longer uses synfuel, and there is no visual sign of contamination.

On-Site Soil: Low. The unit is indoors, over concrete, no longer uses synfuel, and there is no visual sign of contamination.

Air: Low to medium. The unit is indoors and is no longer used as a hazardous waste incinerator; however, there was a lot of cement dust on the floor around the kiln.

Recommendations: The cause for the dust on the floor should be determined and if it is a result of the kiln, appropriate measures to minimize dust release should be taken.

SWMU 3 **Satellite Waste Accumulation Areas**

Conclusions: These units are currently active. The areas are not clearly marked and some drums are not properly sealed. The potential for release via various pathways is summarized below:

Ground water: Low. The units are indoors, on concrete, and any release that may occur would be contained within the facility.

Surface water: Low. The units are indoors, on concrete, and any release that may occur would be contained within the facility.

On-Site Soil: Low. The units are indoors, on concrete, and any release that may occur would be contained within the facility.

Air: Low. The units are indoors and any release that may occur would be contained within the facility.

Recommendations: The facility should find a better way to properly mark the waste areas and seal all drums.

SWMU 4 **Wastewater Treatment System**

Conclusions: This unit is currently active. Presently it handles sanitary sewage from the facility buildings and releases the treated water into Lake Michigan. The potential for release via various pathways is summarized below:

Ground water: Low. The unit is located outside and treats nonhazardous sanitary sewage. Weekly sampling insures identification of a system failure.

Surface water: Low to medium. The unit is located outside and treats nonhazardous sanitary sewage. Weekly sampling insures the integrity of the system, however the outfall from the unit is into Lake Michigan. Should the system malfunction it could contaminate the Lake with nonhazardous sanitary waste.

On-Site Soil: Low. The unit is located outside and treats nonhazardous sanitary sewage. Weekly sampling insures identification of a system failure.

Air: Low. The unit does not handle volatile compounds.

Recommendations: No further action is recommended at this time.

SWMU 5 **Dust Collectors**

Conclusions: The dust collectors are currently active. All observed collectors appeared sound and there was no indication that a release had ever occurred. The potential for release via various pathways is summarized below:

Ground water: Low. The units handle nonhazardous air particulates (cement dust).

Surface water: Low. The units handle nonhazardous air particulates (cement dust).

On-Site Soil: Low. The units handle nonhazardous air particulates (cement dust).

Air: Low to medium. The units handle nonhazardous air particulates (cement dust). If the system were to malfunction, a release to air

would be possible. There was a lot of cement dust on the floor around the kiln.

Recommendations: The cause for the dust on the floor should be determined, and if it is a result of faulty dust collectors, appropriate measures to minimize dust release should be taken.

SWMU 6 **Waste Oil Tank**

Conclusions: This unit is currently active. It handles waste oil and waste lubricants from the routine maintenance of facility machinery and vehicles, and small amounts of spent solvents. The potential for release via various pathways is summarized below:

Ground water: Low to medium. The unit is located outside, on open soil, and there appeared to be oil spillage around the tank.

Surface water: Low. Due to the distance from the nearest surface water (Lake Michigan about a half mile away), the flat terrain, the relatively small amount of waste oil being stored, and that the tank is in a diked area, it appears unlikely that surface water would be contaminated from this unit.

On-Site Soil: High. The unit is located outside, on open soil, and there appeared to be oil spillage around the tank.

Air: Low. Waste oil is kept in a sealed tank.

Recommendations: Sample soil to see if the soil around the tank is contaminated with oil waste, and if contamination is found, appropriate measures should be taken to remediate it. A concrete pad under the tank would protect the soil under the tank from any release.

SWMU 7 **Waste Lubricant Storage Area**

Conclusions: This unit is currently active. It handles waste lubricants from the routine maintenance of facility machinery and vehicles. The potential for release via various pathways is summarized below:

Ground water: Low to medium. The unit is located outside, on open soil, and some of the drums were not properly sealed.

Surface water: Low. Due to the distance from the nearest surface water (Lake Michigan about a half mile away), the flat terrain, and the relatively small amount of waste lubricant being stored, it appears unlikely that surface water would be contaminated from this unit.

On-Site Soil: Medium. The unit is located outside, on open soil, and some of the drums were not properly sealed.

Air: Low. Waste lubricants are kept in small volumes in drums.

Recommendations: Sample soil to see if the area is contaminated with lubricant waste, and if contamination is found, appropriate measures should be taken to remediate it. A concrete pad under the drums would protect the soil under the drums from any release.

SWMU 8 **Battery Storage Area**

Conclusions: This unit is currently active. It handles used batteries from facility vehicles. The potential for release via various pathways is summarized below:

Ground water: Low to medium. The unit is located outside, on open soil, and some of the batteries appeared to be leaking.

Surface water: Low. Due to the distance from the nearest surface water (Lake Michigan about a half mile away), the flat terrain, and the relatively small amount of waste being stored, it appears unlikely that surface water would be contaminated from this unit.

On-Site Soil: High. The unit is located outside, on open soil, and some of the batteries appeared to be leaking.

Air: Low. Waste batteries are kept in small numbers and do not pose a threat to air.

Recommendations: Sample soil to see if the area is contaminated with battery acid, and if contamination is found appropriate measures should be taken to remediate the soil. A concrete pad under the batteries would protect the soil underneath from any release.

AOC 1 **Cement Dust in the Manufacturing Area**

Conclusions: All dust is contained indoors, within the manufacturing area, on a concrete floor, so the potential for release to ground water, surface water, and on-site soils is low. The cause of the large volume of dust should be determined, because it poses a health risk to facility employees who must breathe the air in the manufacturing area.

Recommendations: The facility should find a better way to minimize cement dust in the manufacturing area because it may be a hazard to employees.

REFERENCES

Federal Emergency Management Agency (FEMA), 1981. National Flood Insurance Program; Flood Insurance Rate Map: City of Gary, Lake County, Indiana. Community-panel number 180132 0017 C. Map revised: March 16, 1981.

Indiana Department of Environmental Management (IDEM), 1984. RCRA/TSD inspection letter regarding notice of violation, August 24.

IDEM, 1985. Letter to Lehigh from IDEM approving closure plan, September 23.

IDEM, 1986a. Letter to Lehigh from IDEM requesting sampling around SWMU 1 as part of closure, July 3.

IDEM, 1986b. Certification of closure, September 19.

IDEM, 1987. Certification of withdrawal of Part A permit application, April 13.

Lehigh, 1981a. Notification of Hazardous Waste Activity, January 19.

Lehigh, 1981b. RCRA Part A permit application, January 20.

Lehigh, 1984a. Letter from R. F. Gebhardt (Lehigh) to Karl Klepitsch (USEPA) regarding withdrawal of Part A permit application, January 16.

Lehigh, 1984b. Letter from Rolf Bohman (Lehigh) to Karl Klepitsch (USEPA) regarding withdrawal of Part A permit application, January 16.

Lehigh, 1986. Letter from G. McKenna (Lehigh) to Janet Snedeker (IDEM) regarding closure plan, August 11.

Lehigh, 1991. Map from Facility Emergency and Hazardous Chemical Inventory, February 26.

Pachapa, 1991. VSI Conversation Between Paul Pachapa (Plant Manager) and Rob Singh and Art Marshalla (RAI Inspection Team), November 15.

Rosenshein J. S., and J. D. Hunn, 1968. "Geohydrology and Ground Water Potential of Lake County, Indiana." Geological Survey prepared by the U.S. Department of Interior.

United States Department of Agriculture (USDA), 1972. "Soil Survey of Lake County Indiana." In cooperation with Purdue University Agricultural Experiment Station, July.

United States Department of Commerce (USDC), 1963. Climatic Atlas of the United States. U.S. Government Printing Office, Washington, D.C.

United States Environmental Protection Agency (EPA), 1984. Letter from Karl J. Klepitsch (EPA) to Rolf Boman (Lehigh) regarding withdrawal of Part A permit application, April 13.

United States Geological Survey (USGS), 1968. 7.5-Minute Topographic Series: Tolleston Quadrangle.

Willman, H.B., 1971, "Summary of Geology of the Chicago Area," Illinois State Geological Survey, Circular 460, Urbana, Illinois.

ATTACHMENT A

VISUAL SITE INSPECTION SUMMARY AND PHOTOGRAPHS

VISUAL SITE INSPECTION SUMMARY

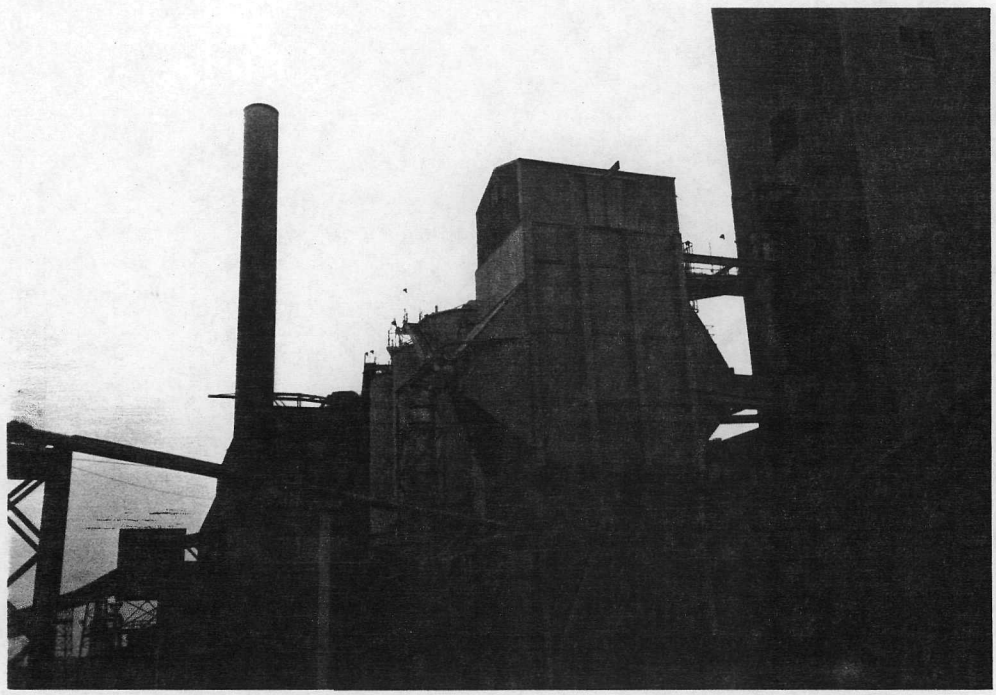
Lehigh Portland Cement Company
Bluffington Station
Gary, Indiana 46401
INT 190 011 973

Date:	November 15, 1991
Facility Representatives:	Paul Pachapa, Plant Manager Dana Dalka, Lehigh Company
Inspection Team:	Robert Singh, Resource Applications, Inc. Arthur Marshalla, Resource Applications, Inc.
Photographer:	Arthur Marshalla
Weather Conditions:	Cloudy, Temperature 45°F
Summary of Activities:	RAI conducted a VSI at the Lehigh facility at 10:00 AM on November 15, 1991. Paul Pachapa explained the facility's operating procedures and waste management practices during an entrance meeting from 10:00 AM to 11:00 AM, in his office. The facility inspection began at 11:00 AM, and included detailed descriptions and observations of plant operations and waste handling units. Dana Dalka accompanied the VSI team and Pachapa on the tour. Dalka took identical pictures to those of the VSI team (for the facility's records). The walk-through inspection concluded at 1:30 PM and an exit meeting was held to answer a few questions and to pick up copies of a facility map and other documents. RAI concluded the inspection at 2:00 PM.

Photograph No. 1 Location: Raw Material Storage
Orientation: North Date: 11/15/91
Description: These are mounds of bauxite and limestone (commercial product) for use in cement manufacture.

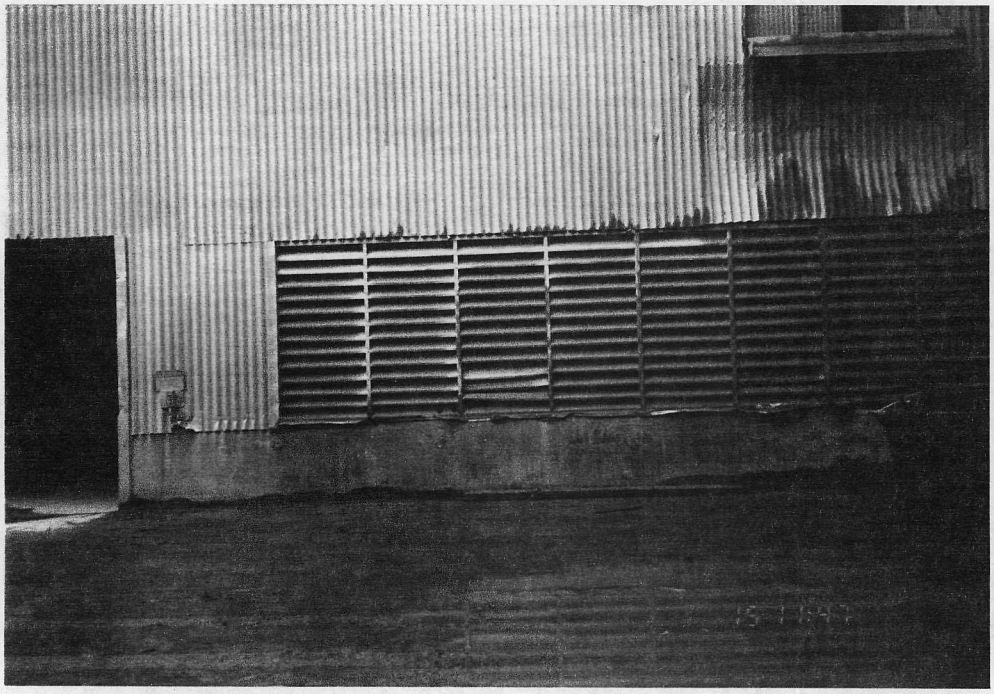
Photograph No. 2 Location: Raw Material Storage
Orientation: Northwest Date: 11/15/91
Description: This is the conveyor tunnel and crane used to unload bauxite and limestone (commercial product) from ships.

Photograph No. 3 Location: Raw Material Storage
Orientation: Northeast Date: 11/15/91
Description: This is the commercial product conveyor belt entering the manufacturing plant.

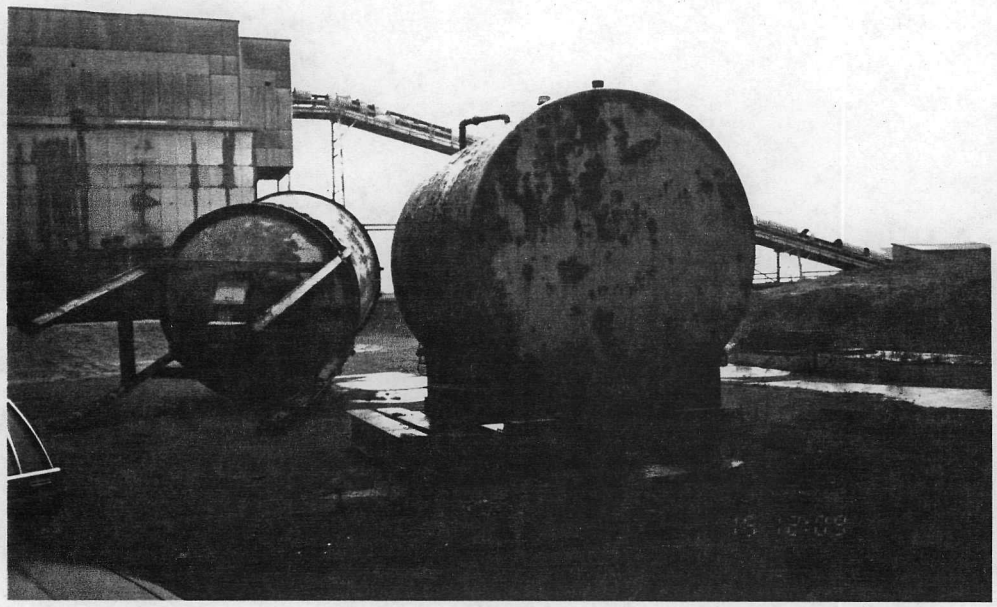


Photograph No. 4 Location: Outside Manufacturing Plant
Orientation: North Date: 11/15/91
Description: This is the kiln stack and electrostatic precipitator used in the manufacture of cement.

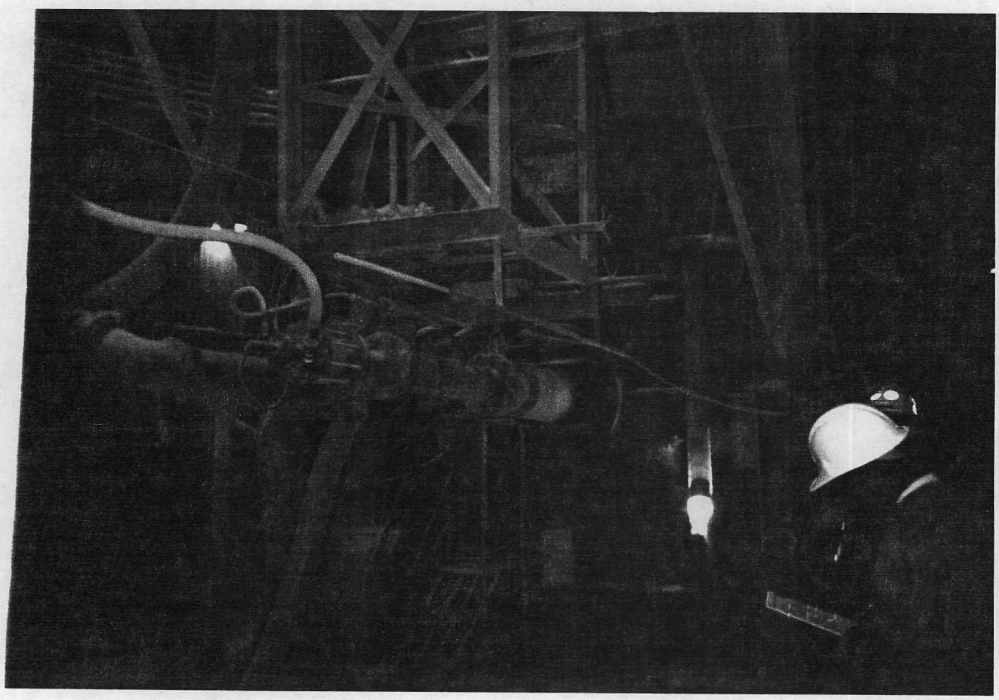
Photograph No. 5 Location: Outside Manufacturing Plant
Orientation: South Date: 11/15/91
Description: This is the finished product pipeline that takes cement to the storage silos and packaging area.



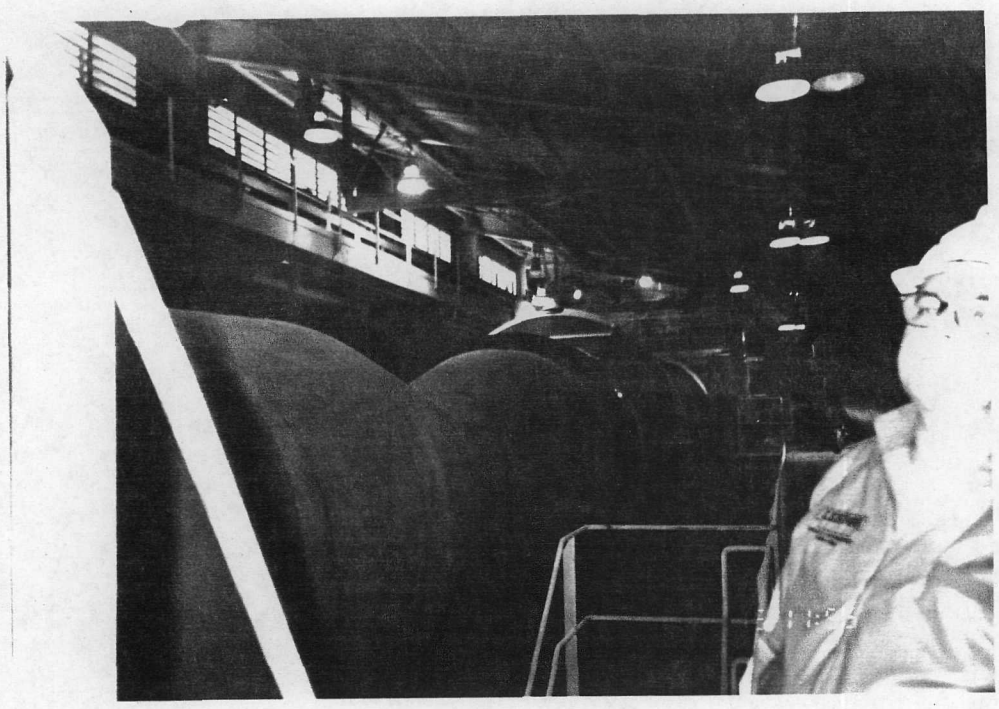
Photograph No. 6 Location: Former Site of SWMU 1
Orientation: Southwest Date: 11/15/91
Description: This is the area which used to house SWMU 1 when the facility was using synfuel to flame the rotary kiln.



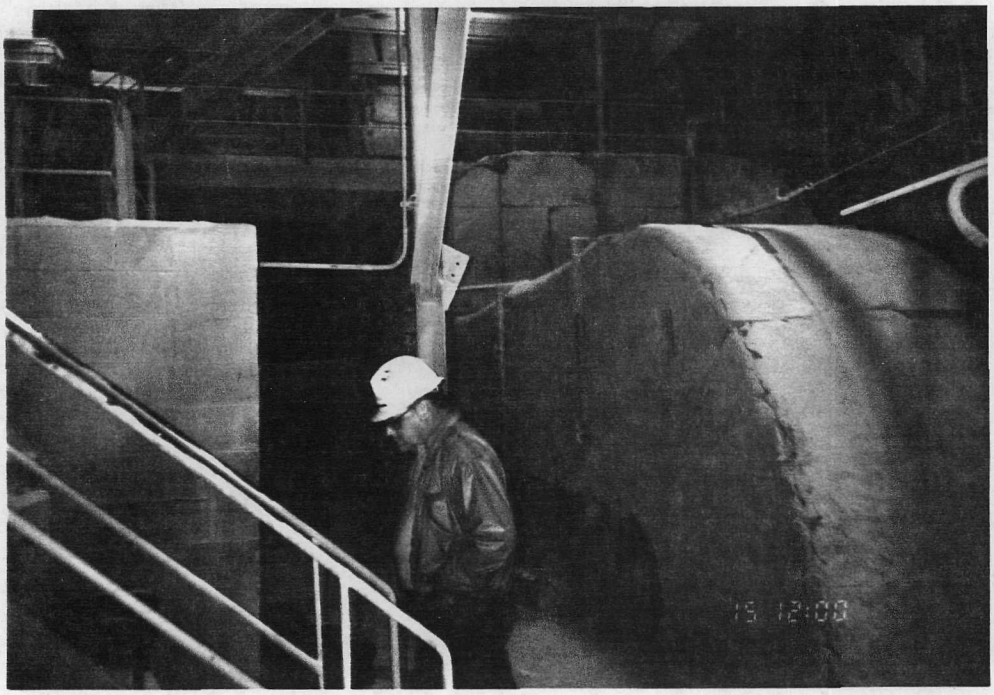
Photograph No. 7 Location: Northeast Part of Facility
Orientation: Northwest Date: 11/15/91
Description: This is the old 7,800-Gallon Synfuel Tank (SWMU 1). It is no longer in use and is being stored between some abandoned buildings.



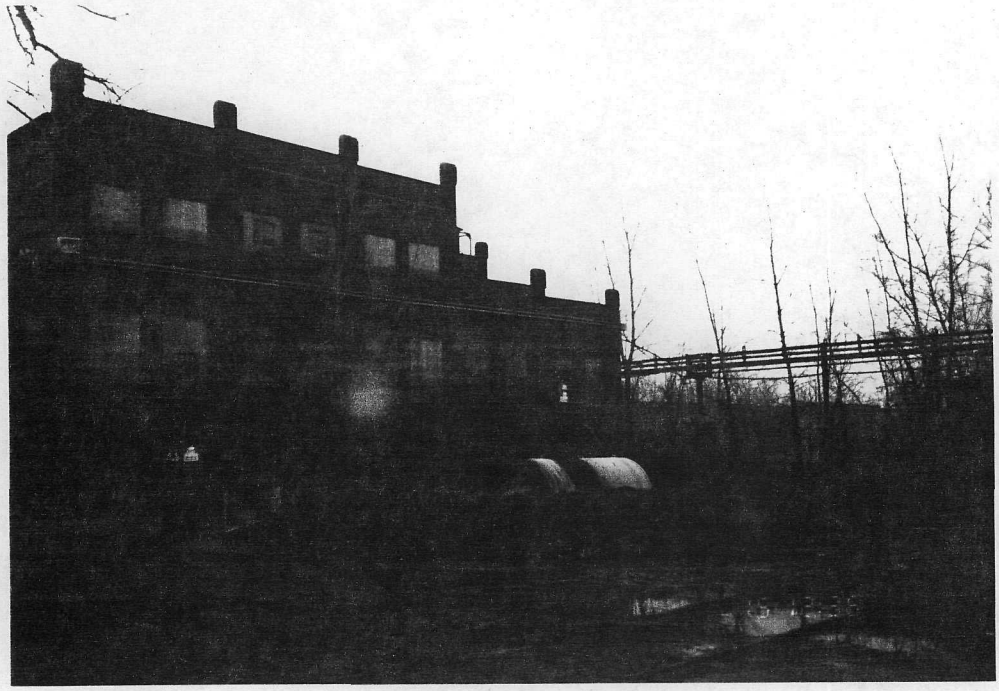
Photograph No. 8 Location: SWMU 2
Orientation: East Date: 11/15/91
Description: This is the burner end of the rotary kiln. Natural gas is being used to flame the kiln.



Photograph No. 9 Location: SWMU 2
Orientation: East Date: 11/15/91
Description: This is a picture of the length of the rotary kiln.



Photograph No. 10 Location: SWMU 4
Orientation: West Date: 11/15/91
Description: This is one of the many large dust collectors in the manufacturing plant.

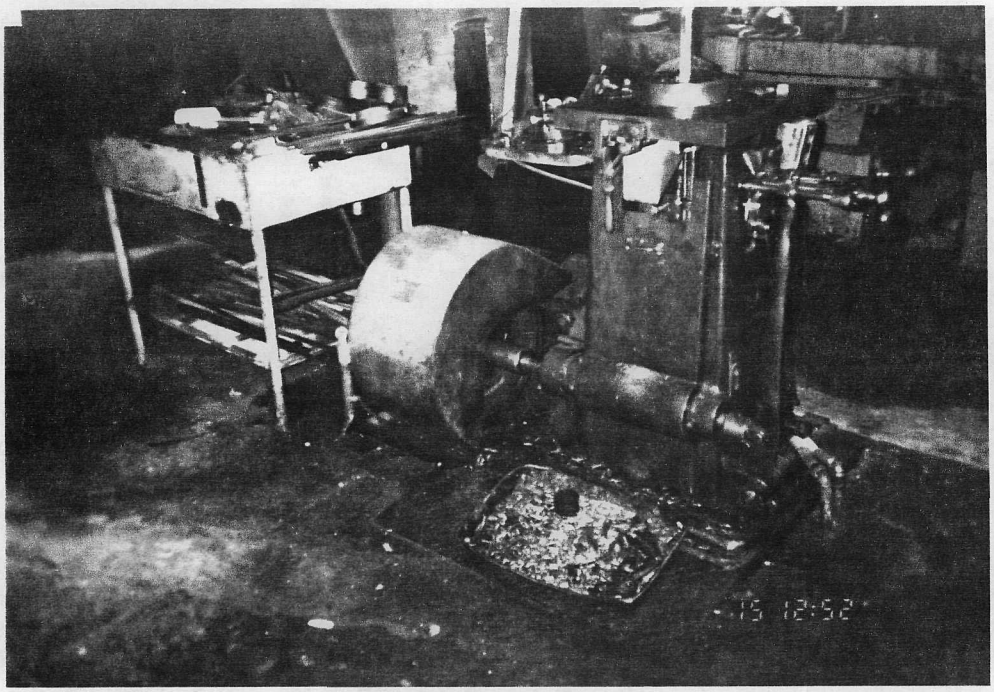


Photograph No. 11 Location: SWMU 5
Orientation: East Date: 11/15/91
Description: This is the Waste Oil Tank that stores oil from the maintenance of facility machinery and vehicles. It is just outside the maintenance shop.

Photograph No. 12 Location: SWMU 6
Orientation: South Date: 11/15/91
Description: This is the Waste Lubricant Storage Area. These drums contain spent lubricants from the routine maintenance of facility machinery and vehicles. Several of the drums were not properly sealed.

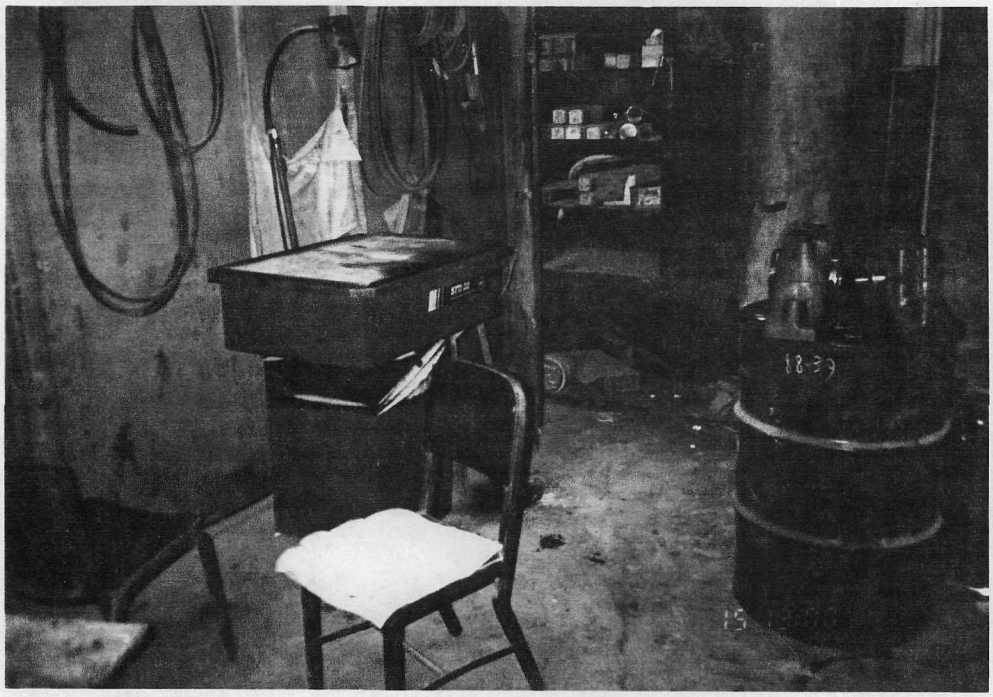
Photograph No. 13 Location: SWMU 7
Orientation: North Date: 11/15/91
Description: This is the Battery Storage Area. Some batteries are stored on wood pallets and some are on the bare ground. Several of the batteries appeared to be leaking.

Photograph No. 14 Location: SWMU 3
Orientation: South Date: 11/15/91
Description: This is a Satellite Waste Accumulation Area for nonhazardous waste oils in the machine shop. The two drums are open and the only warning is the "No Smoking" sign.



Photograph No. 15 Location: SWMU 3
Orientation: North Date: 11/15/91
Description: This is a Satellite Waste Accumulation Area for metal shavings. It is a pan that is used to collect shavings from the lathe.

Photograph No. 16 Location: SWMU 3
Orientation: East Date: 11/15/91
Description: This is a Satellite Waste Accumulation Area for waste oil rags in the machine shop. The rags are thrown out with regular solid wastes (paper, wood, etc.).



Photograph No. 17 Location: Near Manufacturing Area
Orientation: Southwest Date: 11/15/91
Description: This is a parts washer used to clean various tools in manufacturing. Small amounts of solvents are used to clean the tools.

ATTACHMENT B
VISUAL SITE INSPECTION FIELD NOTES

(77)

11/1

(8)

SITE: Lehigh Portland
CEMENT COMPANY

Buffington Station
Gary, Indiana 46401

RAI Personnel: Rob Singh
Art Marshall

Lehigh: Paul Pachapa, Plant Mgr
Dana Dalka

Size: 250 acres 79 employees

10 day on 4 day off schedule
3 shifts 24 hrs a day

History: 1903 Portland cements
were produced by I.L. Steel

US Steel owned until 1980
sold to Lehigh Atlantic Cement
1970 plant was opened

Cement operations

Dumpster - wood, paper scrap iron
No hazardous wastes
Once a year sends out motor oil

(11) 11/15/91

RCRA Status = closed 1987

Remedial action 20' x 20' x 3½' soil excavated & put in process (under synfuel tank)

Site boundary: Lime Plant, Power Plant = East
Lake Michigan = N
Vacant, light industrial residential = S, W

Right on Lake Michigan (Buffington Harbor)

Controlled Entry = yes visitors must check in

Danger Signs at entrance

Limestone & Bauxite craned off ship (raw materials)
Electrostatic precipitate recycled into process

Present waste = Machine shop oils

11/15/91 (12)

Stored in tank removed off site by Safety Kleen

Contamination = 20 x 20 - 3½' area was sampled - no need. See 8/11/88 letter

No complaints by residents/employees

Have NPDES permits & NPDES for releasing facility water to Lake Michigan

No other surface water except Lake Michigan

Process Steps

(1) Ex-situ harbor by belt conveyor and front end loader
(2) Rotary Kiln
(3) By overground pipeline to shipping/packaging area (storage silos)

Service own equipment in machine shop
Send out waste oils (Safety Kleen)

(51) 11/15/91

2000 gallon waste oil tank that is filled and pumped out when necessary — About 1000 gallons axe a year

Air Dust Collector — bags are recycled/ reused, dumped back into process

WATER

Gary Hobart water - no gw wells or storm sewers

Not aware of any local wells

water from Lake Michigan

NPDES

Storm water, septic house, chlorinator weekly test

Rotary kiln - only burning natural gas

Lab - X-ray analysis of cement

11/15/91 (52)

Machine shop + oil storage

Sinfuel (previously bought from Fisher-Calo

WALK THROUGH

Dana Dalka (facility) will take pictures with us for facility records.

Shipping and receiving also by train.

Belt conveyor carries bulk raw materials to facility - bauxite (red) limestone (grey)

Precipitator

Pipeline to silos / bagging area

3 silos of raw materials (bauxite/limestone)

Removed sinfuel tank (mining there)

Tons of abandoned buildings all over site

(53) 11/15/91

Rotary kiln was going off-line (10th day)

Mechanical Dust Collectors
air gas in ⇒ turning vanes ⇒ dust drops out

Old 7,800-gallon Synfuel tank on NE side of inactive area

Illiana Disposal Service for paper

Inside Storage Area – product bags on wood pallets covered in plastic – Very clean

Boxcars come right up to loading dock and are filled & moved / also trucks

15 x 2000 lbs silos before ~~manufac~~ packaging (from manufacturing)

11/15/91 (54)

Air is pumped into tank and separated from concrete / dirt

Machine Shop

Service
Waste oil kept in diked (1 fault) area 2000 gallon tank (some spillage on floor)

Bldg K Abandoned – not used

Battery Storage on wood pallet

Waste Cork grind & grease from lubrication to be mixed in oil tank

~~Waste~~ Waste oil drums open – No smoking sign
cutting oils w/drip pans

Oil rags dip out with solid waste [Illiana Disposal]

Shavings go to metal scrap

~~Parts~~ Parts Washer